## CLAIMS

1. (Currently amended) A sensing system adapted to measure one or more values corresponding to one or more physical parameters, the system comprising:

a first sensor mounted onto a side of an optical fiber and optically coupled to said fiber, wherein:[[,]]

the first sensor is one of a plurality of sensors, in which each sensor is optically coupled to the fiber; and

when interrogated with light coupled into the fiber, the first sensor generates an optical response corresponding to a first value of a first physical parameter to provide a measure of the first value; ~~and~~

a first optical filter inserted into the fiber, wherein the first filter is adapted to direct light corresponding to the first sensor between the fiber and the first sensor; and

an interrogation device optically coupled to the optical fiber, wherein the interrogation device comprises:

a plurality of light sources, each adapted to generate light for optically interrogating a respective sensor of the plurality of sensors;

an optical multiplexer adapted to multiplex the light generated by the light sources and direct resulting multiplexed light to the optical fiber for interrogating the sensors of the plurality of sensors;

an optical de-multiplexer adapted to receive from the optical fiber light reflected from the sensors of the plurality of sensors during the interrogation and decompose the received light into a plurality of optical components, wherein each of the optical components corresponds to a different respective sensor of the plurality of sensors; and

a plurality of optical receivers, each adapted to receive a respective optical component of the plurality of optical components.

2. (Canceled)

3. (Previously presented) The system of claim 1, wherein the filter is aligned with the first sensor and oriented at about 45 degrees with respect to the longitudinal axis of the fiber.

4. (Previously presented) The system of claim 1, further comprising a second sensor optically coupled to the fiber, wherein the first filter is designed to be substantially transparent to light corresponding to the second sensor.

5. (Original) The system of claim 4, wherein the second sensor is mounted at a terminus of the fiber.

6. (Original) The system of claim 4, further comprising:

a second optical filter inserted into the fiber, wherein:

the second sensor is mounted onto the side of the fiber at a location downstream from the location of the first sensor; and

the second filter is adapted to direct light corresponding to the second sensor between the fiber and the second sensor.

7. (Original) The system of claim 4, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a second value of the first physical parameter to provide a measure of the second value.

8. (Currently amended) The system of claim 4, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a value of a second physical parameter different from the first physical parameter to provide a measure of said value<u>, wherein the first and second physical parameters belong to a group consisting of pressure, strain, stress, and temperature</u>.

9. (Previously presented) The system of claim 1, wherein the light corresponding to the first sensor is substantially monochromatic light.

10. (Canceled)

11. (Previously presented) The system of claim 1, further comprising:

a catheter having an external tube and an internal tube enclosed by the external tube, wherein:

the internal tube accommodates the fiber;

the first sensor is exposed on an exterior of the external tube;

the first physical parameter is pressure; and

the catheter is adapted to be inserted into a blood vessel to enable the first sensor to sense blood pressure in said blood vessel.

12. (Currently amended) The system of claim 1, wherein the first sensor comprises:

a substrate;

a first layer supported on [[a]] the substrate, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter;

a second layer supported on and fixed with respect to the substrate, wherein the first and second layers form a sealed chamber physically connected and optically coupled to the fiber, wherein:

the portion of the first layer and a portion of the second layer form a Fabry-Perot interferometer (FPI) optically coupled to the fiber, which FPI has variable cavity length due to mobility of the portion of the first layer; and

when the portion of the first layer is moved, the reflectivity of the ~~chamber~~ FPI changes.

13-14. (Canceled)

15. (Original) The system of claim 1, further comprising a second sensor optically coupled to the fiber, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a second value of the first physical parameter to provide a measure of the second value.

16. (Currently amended) The system of claim 1, further comprising a second sensor optically coupled to the fiber, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a value of a second physical parameter

different from the first physical parameter to provide a measure of said value<u>, wherein the first and second physical parameters belong to a group consisting of pressure, strain, stress, and temperature</u>.

17. (Currently amended) An optical arrangement, comprising:

an optical filter inserted into an optical fiber; and

an optical device mounted onto a side of the fiber and optically coupled to the fiber, wherein the filter is configured to direct light corresponding to the optical device between the fiber and the optical device<u>, wherein the optical device is a sensor adapted to measure a value corresponding to a physical parameter, the sensor comprising:</u>

<u>a substrate;</u>

<u>a first layer supported on the substrate, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter;</u>

<u>a second layer supported on and fixed with respect to the substrate, wherein the first and second layers form a sealed chamber physically connected and optically coupled to the fiber, wherein:</u>

<u>the portion of the first layer and a portion of the second layer form a Fabry-Perot interferometer (FPI) optically coupled to the fiber, which FPI has variable cavity length due to mobility of the portion of the first layer; and</u>

<u>when the portion of the first layer is moved, the reflectivity of the FPI changes</u>.

18. (Original) The arrangement of claim 17, wherein the filter is aligned with the optical device and oriented at about 45 degrees with respect to the longitudinal axis of the fiber.

19-21. (Canceled)

22. (Previously presented) The system of claim 1, wherein the side is parallel to the longitudinal axis of the fiber.

23. (Previously presented) The arrangement of claim 17, wherein the side is parallel to the longitudinal axis of the fiber.

24-28. (Canceled)

29. (New) A sensing system adapted to measure one or more values corresponding to one or more physical parameters, the system comprising:

a first sensor mounted onto a side of an optical fiber and optically coupled to said fiber, wherein:

the first sensor is one of a plurality of sensors, in which each sensor is optically coupled to the fiber; and

when interrogated with light coupled into the fiber, the first sensor generates an optical response corresponding to a first value of a first physical parameter to provide a measure of the first value;

a first optical filter inserted into the fiber, wherein the first filter is adapted to direct light corresponding to the first sensor between the fiber and the first sensor;

an interrogation device including, for each sensor, a light source and a receiver, wherein:

each light source is optically coupled to an optical multiplexer adapted to combine light from different light sources and apply the combined light to the fiber; and

each receiver is optically coupled to an optical de-multiplexer adapted to receive from the fiber light reflected from the sensors, decompose the received light into a plurality of components, each component corresponding to a different sensor, and apply each component to the corresponding receiver.